two-dimensional sensor, either an accelerometer or magnetometer, or two one-dimensional sensors, i.e. accelerometer and magnetometer, can be implemented. The sensitive axis of each dimension of such two-dimensional sensor is preferably perpendicular to one of the degrees-of-freedom connecting part **2** to part **1** within the mobile phone. Depending on the mobile phone configuration, expressions for the different sensors can now be found in a similar way, as function of two angles β, and ξ representing the degrees-of-freedom, e.g. $\langle S_i \rangle = f_i(\beta,\xi)$ for two different sensor axes.

In both one-dimensional examples, as discussed before, a general form of the expressions for the accelerometer or magnetometer signal <S> is

$$\langle S \rangle = f(\beta) = u \cdot \cos\beta + v \cdot \sin\beta$$

wherein the scalars u and v can be determined from the orientation O**1** of part **1** and the inclination angle of the magnetic field in the case of a magnetometer. This equation can be solved for the hinge angle β in different ways, either analytically or iteratively. However, for a single orientation O**1** of part **1** (i.e. fixed coefficients u, v, this equation in general has two solutions. The solution can be found using (a combination of) different strategies, including: taking into account the boundary conditions, i.e. minimum and maximum values for the rotation angle β. For clam-shell phones, it is assumed that $0 \leqq \beta \leqq 180°$.

1. taking into account at least two different orientations O**1** of part **1** (i.e. at least two sets u, v). In the assumption that the rotation angle β has not changed, a unique solution can be found for the different sets of sensor values.
2. taking into account a priori information for weighing different solutions, e.g. the use of the previous solution as best guess for the next solution. This is preferred in the assumption that the angle β does not change often during mobile phone use.
3. Elaborating further on the last option, one may implement this feature in the following way. Rather than calculating the rotation angle β for every point, one simply verifies the equation

$$\langle S \rangle = u \cdot \cos\beta + v \cdot \sin\beta$$

for its validity in the assumption that the angle β has not changed. Such implementation will be more efficient in terms of calculation time and power. Only when the equation is no longer valid, one will go back to the previously listed options for defining a new value for the rotation angle β.

The determination of the orientation O**2** of the part **2** further has the advantage that it is known whether the device is closed (the orientations O**1** and O**2** are such that the internal angle β is zero) or not (the orientations O**1** and O**2** are such that the internal angle β differs from zero). It is not required to implement a switch or other means to determine whether the device is closed or not. The information on whether the device is closed or not can be used in the usual manner. For example, the device may be switched off when is detected that it is closed.

The determination of the orientation O**2** of the part **2** further has the advantage that the internal angle(s) connecting the different parts is/are known. This information can be used in different ways. For example, the device may be switched on or off when a threshold value for the internal angle is crossed. Audible and visual effects may be included into the mobile phone, whereby the perceived effect relies on an internal angle β as parameter.

In an embodiment the device is a mobile phone with a user input part **1** which usually has input keys **10** to input numbers and/or characters and a display part **2** which is movable with respect to the user input part **1**. Because the display part **2** should be slim it is not possible to provide a three-dimensional orientation sensor **11** in the display part **2**. Therefore, this relatively large sensor **11** is implemented in the user input part **1**. Consequently, the three-dimensional orientation O**1** of the user input part **1** is known. However, this may lead to incorrect display of position information OI on the display **20** of the display part **2** because its orientation O**2** is not known. A further, relatively small sensor **21** is provided in the display part **2** such that together with the sensor **11** in the user input part **1** it is possible to determine the three-dimensional orientation O**2** of the display part **2** and to correct the display of the position information OI such that it is correctly displayed on the display **20**.

It should be noted that the above-mentioned embodiments illustrate rather than limit the invention, and that those skilled in the art will be able to design many alternative embodiments without departing from the scope of the appended claims.

For example, the circuit **5** for calculating and the circuit **6** for generating the orientation information may be a single circuit, for example a suitably programmed micro-processor or a dedicated circuit. These circuits may be present in either the first part **1** or the second part, or may be divided over the first part **1** and the second part **2**. Any communication of information between the first part **1** and the second part **2**, or the other way around, may be performed by known or dedicated interface which preferably is a digital interface such as for example SPI or I2C. Preferably, the sensors **11** and **21** provide their orientation information via such an interface.

In the claims, any reference signs placed between parentheses shall not be construed as limiting the claim. Use of the verb "comprise" and its conjugations does not exclude the presence of elements or steps other than those stated in a claim. The article "a" or "an" preceding an element does not exclude the presence of a plurality of such elements. The invention may be implemented by means of hardware comprising several distinct elements, and by means of a suitably programmed computer. In the device claim enumerating several means, several of these means may be embodied by one and the same item of hardware. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage.

The invention claimed is:

1. A device comprising:

a first part having user input means and comprising a three-degrees-of-freedom orientation sensing system for determining a three-degrees-of-freedom orientation of the first part with respect to a reference coordinate frame (XYZ) defined by the earths gravity field (Fg) and magnetic field (Fm),

a second part comprising a display for displaying orientation information on a three-degrees-of-freedom orientation of the second part, and sensing means for sensing an one-degree-of-freedom or a two-degrees-of-freedom orientation of the second part, and

means for calculating the three-degrees-of-freedom orientation of the second part from the three-degrees-of-freedom orientation of the first part and the one-degree-of-freedom or the two-degrees-of-freedom orientation of the second part, and

means for generating the orientation information in response to the calculated three-degrees-of-freedom orientation of the second part to obtain correct display of the orientation information independent on an orientation of the second part with respect to the first part.